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Table 4. Effect of Grazing Mineral Supplement on Receiving Performance

Item	Mineral Supplement ^a			AVG
	TRT1	TRT2	TRT3	
ADG (lbs.)	4.07	4.39	4.19	4.20
Intake (lbs/day)	28.5	27.2	26.0	27.2
F/G	7.02	6.25	6.27	6.51

^a1 = Salt; 2 = Salt, Ca, P; 3 = Salt, Ca, P, Se, Zn, Cu

Implications:

Because of the limited number of pastures and animals used, this study will be repeated in 1994. This will increase our ability to detect differences due to the experimental treatments. During the first year of this study, we were unable to demonstrate a response from grazing mineral supplement during the receiving period.

Experimental High Magnesium Tall Fescue

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Grass tetany is a nutritionally related health problem faced by cattle grazing cool season forage during early green-up. Also known as hypomagnesemia, it is the result of inadequate intake of magnesium (and or calcium) in the early spring grass. Low blood magnesium levels cause partial or total paralysis and affected animals may "go down" very quickly. Although occurrences of grass tetany are sporadic, lactating animals grazing grasses in cool, wet springs are at greatest risk for this disease. Increased N or K fertility also increase the incidence of grass tetany.

Attempts to increase magnesium in the plants through fertilization or application of dolomitic (high magnesium) lime have generally not been successful due to adverse effects of mag fertility on plant calcium content. Supplementation of the animals' ration with magnesium oxide is difficult due to

poor palatability. An alternative method currently being evaluated is the selection of fescue cultivars that are naturally able to take up greater amounts of magnesium for cattle to consume, thereby eliminating the need for supplementation.

Such a selection, currently being referred to as HiMag fescue, is the subject of ongoing research at the Southwest Center. Greenhouse and plot work have demonstrated that HiMag contains higher magnesium levels in the herbage than other currently available varieties including Kentucky-31. Replicated one-acre pastures have been planted to HiMag and four comparison varieties of tall fescue to evaluate animal responses under grazing conditions. Preliminary data from the first year of a planned three year project are presented in this report.

Fifteen 1-acre pastures were planted with either HiMag as the test variety or K-31, Martin, Mozark or AU Triumph as comparison varieties. All tall fescue pastures are endophyte-free. Herbage samples were collected from each pasture during the initial grazing period from October through November of 1993. Mineral content of the herbage is shown in Table 1. Magnesium content was 19% higher in the HiMag cultivar compared to other varieties. Calcium (Ca) was also higher, while no differences were seen for potassium (K), phosphorus (P) or iron (Fe). K-ratio was lowest for HiMag (a K-ratio of 2.2 or higher results in high risk of grass tetany while a lower ratio indicates reduced danger).

Table 1. Forage mineral content of tall fescue cultivars grazed during Oct.-Nov., 1993 at Mt. Vernon, MO.

Cultivar	Mg	Ca	K	P	K-Rat ¹	Fe
	mg/g					µg/g
K31	2.23	3.79	21.4	3.08	1.47	96
Martin	2.3	3.97	19.2	2.95	1.27	102
Mozark	2.49	3.85	21.2	3.14	1.37	100
AU Triumph	2.49	3.43	20	3.19	1.37	97
HiMag	2.83	4.47	20	3.16	1.23	96
LSD	0.28	0.52	2.6	0.31	0.29	20

¹K-Rat = $K/(Mg + Ca)$. This ratio is an indicator of the risk of grass tetany problems; a lower ratio indicates a lower risk.

Forty-five crossbred beef steers grazed the five tall fescue cultivars during October–November of 1993. Average daily gains and blood magnesium levels are shown in Table 2. Differences in average daily gain were not significant, although numerically HiMag was slightly higher. Blood plasma magnesium was

higher for steers grazing the HiMag pastures suggesting that grazing HiMag tall fescue can get more magnesium into the animals.

During the spring and early summer of 1994, steers were again used to evaluate the five tall fescues. Results of this period are not available at this time. Also, keep in mind that steers are not as susceptible to grass tetany as lactating cows due to their lower magnesium requirement. Therefore, plans are currently underway to obtain a small herd of beef cows for use in this study for the next two years of evaluation of HiMag. Results from these future rounds of grazing will be reported as they become available.

Table 2. Average daily gain and magnesium concentration in blood plasma from stocker cattle grazing tall fescue cultivars during Oct.-Nov., 1993 at Mt. Vernon, MO.

Cultivar	ADG	Plasma-Mg
	lb/day	mg/dL
K31	0.89	2.5
Martin	0.86	2.4
Mozark	0.92	2.5
AU Triumph	0.92	2.6
HiMag	0.99	2.7
LSD	0.41	0.2